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ABSTRACT

Environmental influences on the development of children's reflective capacities and their knowledge of freehand drawing were investigated among preschool, kindergarten and first-grade children. One aspect of the social context of drawing was considered: the interactions that take place when children draw in the company of peers. Tapes of children's interactions while involved in art activities were collected in regular classroom and small group settings at intervals of 2 to 3 weeks throughout the school year. In the small group setting the researcher provided the children with drawing materials and suggested a subject for the children to draw. Classroom data were collected to ensure that small group interactions were typical of everyday classroom behavior. Previous research provided instances of six categories of children's understanding of the nature of drawing. These categories are briefly discussed and children's utterances related to the categories are included as examples. Four types of peer interaction that influence children's drawing behavior are identified from inspection of the taped conversations. For example, it is suggested that peer questions and critiques may promote a tendency in some children to take a reflective stance toward their drawings. Illustrative instances of children's talk are given for each type of interaction. Discussion of the findings of this study focuses on how two aspects of reflexive abstraction operate in peer drawing experiences. (Author/RH)

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Children's Interactions as They Draw: Hypotheses about Peer Influence on Representational Awareness

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Children's Interactions as They Draw: Hypotheses about Peer Influence on Representational Awareness

Many have found rich information about cognition in children's drawings (Arnheim, 1969; Piaget & Inhelder, 1969; Goodnow, 1977). We began as others have by looking at the drawings themselves, but soon became interested in what children were saying about their efforts. We found that children's verbalizations provided a wealth of clues to their conceptual understanding of drawing and to the extent of their reflectiveness or cognitive monitoring during the drawing activity. This dimension of children's involvement in drawing we call representational awareness.

In a previous phase of the investigation we examined the nature of young children's representational awareness, focusing on the verbalizations which suggested the child was reflecting on his efforts or revealed what he knew about the nature of drawing. In the current paper we are turning our attention to the how-question: how do the child's reflective capacities and knowledge of drawin develop? What role if any does the environment play? For constructivists, the question of environment is a matter of identifying experiences that may play a role in the restructuring of children's notions and in the movement from action schemes to conceptual understandings.

Piagetian theory contains a number of formulations about the role of experience in conceptual development. A central notion is that of reflexive abstraction, the process through which one derives information from one's own actions — putting them into correspondence, linking them, ordering them, and so on. Reflexive abstraction provides the links between and among experiences. It has two aspects: (1) projection of knowledge from a lower to a higher level, and (2) re-organization or reconstruction of knowledge at a higher level (Gallagher and Reid, 1981; Piaget, 1977).

The impetus for reflexive abstraction is in activity, but this does not necessarily mean the manipulation of objects. Activity also refers to a mental process, which can be triggered through social interchanges and verbal input as well as physical experience. Purely verbal input can provoke reflexive abstraction by disturbing an existing construct or by requiring the child to bring implicit or practical knowledge to a conceptual level. We will be seeing these mechanisms in action as we examine the data.

One point before we proceed: we are not suggesting that peer interactions are necessary for the emergence of representational awareness. A variety of factors surely operate in this development, factors in the child's emerging capacities and in his interactions with the world of pictures and people. Interactions with adults no doubt play a role, and encounters with older siblings have been noted by Fenson (1977) and Gardner (1980). Our observations allow us to consider one part of the social context of drawing, the interactions that take place when children draw in the company of peers, as often happens in the preschool or school setting.

METHOD

The data on which this paper is based were gathered with three groups of children: 76 preschool children (3-4 to 4-11 at the first session), 18 kindergarten children, and 20 first-graders.

Drawing sessions were held at intervals of two to three weeks throughout the school year. Children were invited in groups of three or four to a room adjacent to the classroom. The experimenter was a familiar adult. She provided the children with magic markers and paper and talked with them about a topic which she asked them to draw. The sessions were taped and transcribed.

To ensure that children's interactions in these sessions were typical of their everyday classroom behavior, we collected additional data by placing a wireless microphone on the table in the regular art area. We were satisfied

that children's interactions were similar in the two situations. The data reported here are taken from both the experimental and classroom contexts.

RESULTS

Evidence of Representational Awareness in Young Children

The children in our study had quite a lot to say about their drawings. In a previous report (Copple, Cocking, & Waxman, 1980), we have summarized the verbal data reflecting children's representational awareness. Today we will provide a brief overview of children's knowledge of the nature of drawing as described in this report. We will then turn to the topic of the current paper, the interpersonal events hypothesized to play a role in the development of representational awareness.

Children's understanding of the nature of drawing: six categories. On the handout labeled Table 1, six categories are listed. In the first (Possibility/Need for Likeness), the child shows an awareness that the drawing is supposed to look like its referent. She knows that there are standards of resemblance and one can succeed or fail to varying degrees in achieving a good likeness.

The next set of comments reveal an awareness that drawings can or should convey information to those who view them (Possibility/Limitation of Drawings in Conveying Information). The child knows that a drawing can depict a referent such that a viewer is able to identify it and he knows that viewer misinterpretation is a possibility as well.

The third category of comments shows an awareness of the Possibility of Exercising Selection/Discretion in Drawing. The child either expresses the idea that there are different ways of drawing the same referent or the notion that you the artist can select from all the possible parts or features those you want to include. A related type of comment shows an awareness of the

Possibility of Altering Reality in Drawing. The child has the idea that you can play with the elements of drawing — you can make McDonald's purple or draw bald boys, even though you know that is not the way things are in reality.

In the next category of utterances, the child shows that he knows a referent can be drawn in various transformations — happy vs. sad, light rain vs. heavy rain, etc. The child may not be able to achieve distinctive depictions of the state, expression, or position of the referent, but the intention is there. [See examples for Possibility of Drawing Objects or Events in Various States, Forms, or Positions]

The last set of comments (Difficulty of Conveying Certain Aspects in Drawing) is relatively rare in children under six, at least in the situation we were using. A few remarks appeared in our protocols that dealt with a problem or limit imposed by the pictorial modality, e.g. some children wanted to draw both sides of an object or tried to show motion.

Peer Interactions and the Development of Representational Awareness

Since this was a naturalistic investigation, we cannot make causal statements with authority. We can only state what sorts of behaviors occur and suggest the mechanisms through which a given type of event may play a role in provoking representational awareness. We will begin with the events where there is the strongest suggestion of impact, those where there is a direct confrontation by one child and an overt response from another.

Children often looked at each other's drawings and questioned or criticized what they saw. In some cases these comments probably have little effect. In other cases, it is evident that a question or critique produces a conflict in the child about his drawing. Turn to Table 2 of your handout and look at the first example under I. Anna's critique of Tanya's ball is first met with a rather vague defense ("So it could be a ball"). When Anna further specifies her misgiving ("Well, it doesn't look rounded up"), Tanya changes the referent

to an egg. She has used one possible strategy for resolving the conflict precipitated by Anna's comment. If her creation is not round enough to be a satisfactory ball, how about changing it to an egg? Tanya used this strategy in a later session, again in drawing balls (apparently her bête noire). On the second occasion she relabeled her oddly-shaped balls as lightbulbs.

Example 2 under I is another instance of a child's re-examining her drawing in the light of a peer question. Up until Dara's challenge, Thea has shown no sign of being dissatisfied with her multi-colored person. When confronted with a question from her friend, she was able to reflect on the issue of the color a person should be.

Events such as these may increase the child's awareness of a certain aspect of drawing, e.g. shape or color. More broadly, by provoking the child to stand back from her drawing, peer critiques are hypothesized to promote the tendency to take a reflective stance in relation to one's drawing.

Another type of discrepancy children encounter when they draw in a group can be seen in the second set of examples. Child$_1$ labels his drawing as a chicken; Child$_2$ looks at his friend's page and sees a four-legged creature that to his eye is not very chickenlike. Or a child looks at her friend's picture, remarking that it looks like a sun, and is informed that it is a flower. In these events a conflict is potentially generated by the discrepancy — whether one is the artist or the viewer. The artist is puuled into the role of viewer by confronting someone else's perception of what he has drawn. The viewer is confronted by the disparity between his own impressions and what the artist states as his intended referent. In both cases, a distance is created from the immediate action or perception.

A third event type that may be hypothesized to play a role in provoking or consolidating representational awareness may be seen in the examples of

III. Here a child hears a peer expressing uncertainty or dissatisfaction with his or her own drawing. In some instances, as in the first six examples, the child is simply witness to a question or self-appraisal. The actual effect on the child hearing such verbalizations is unknown, but our data suggest that it depends on a number of factors.

One factor that influences the child's response is the degree of interest he has in what his peer is inquiring or fretting about. He may be drawing something similar, a frequent state of affairs in our sessions, which undoubtedly increased verbal exchanges. Or the child may be particularly interested in the topic of the peer's drawing or the type of problem he is describing. (Peers are also likelier to give each other advice when they are drawing the same thing, as in Lee's assistance to Tanya in Example 7 of III).

At this point, I will digress briefly to mention a set of variables that cut across all the kinds of peer interactions we have observed. Children differ in their status within the group for a variety of reasons — age, ability, personality, and so on. Higher-status children on the whole have more impact than lower-status children, at least to the point of having their remarks taken more seriously. There are also special friends who seem to pay more attention to each other's remarks than to those of other children. Individual differences in personality can be observed in responses to peer comments. One child may consistently take criticism much to heart while another barely hears it. We have only informal impressions on the effect of these factors, but it seems reasonable to assume that the effect of a given comment varies with the individual children involved and with their relationship to each other.

The final category of events we will consider here are the occasions when a child hears a peer comment that conveys knowledge or reflection about drawing. Examples can be seen under IV. The peer remark may be about a

representational problem or solution, a talking-about while attempting to draw something. The comment may show an awareness of some aspect of the possibilities or limitations of drawing, such as the demands of drawing so that a viewer can interpret correctly. The examples listed in Table 1 are representative of the category we refer to here, relatively high-level comments of representational awareness that other children hear a peer make. Additional instances are listed under IV. In some of these cases, the original comment was followed by some verbalization indicating that a child responded to it. Sometimes children reacted by looking at the speaker or his paper. We can often do no more than infer that a response has registered with a child. Even greater inference is required to assert that comments of any of the types discussed definitely have an impact on children's development. What we can state with certainty at this point is that events and interactions of the kinds discussed are commonplace when children draw in the company of peers.

DISCUSSION

It should be noted that some of the kinds of events discussed above can occur with adults or older siblings as well. For instance, an older sibling may ask, "What's that — a flower?" when the child has tried to produce a tree. Or an adult may make a comment that communicates some aspect of the nature of drawing, e.g. "I can tell that's you because of the blond pigtails." These events can be assumed to have effects that are not dissimilar from those that operate with peers. On the other hand, adults are generally less likely to criticize a child's drawing, and rightly so. Children also react differently to a given comment depending on its source. When a peer makes a comment, a child is likelier to offer a rebuttal or justification than he would be if the comment were made by

an adult or older sibling. So, for a variety of reasons the kinds of events observed in this investigation are more characteristic of peer situations than of other social situations children have with drawing.

Having examined some of the predominant types of interactions during peer drawing sessions, let's return to the notion of reflexive abstraction. As you will recall, reflexive abstraction has two essential aspects: projection of knowledge from a lower to a higher level, and (2) re-organization or reconstruction of knowledge at a higher level. At the risk of oversimplifying these notions, I would like to conclude by returning to several examples and looking at how these two aspects operate in peer drawing experiences.

In the dialogue between Lee and Tanya, Lee had finished his duck when Tanya expressed her uncertainty as to how a duck should be drawn. Lee had performed the activity of drawing a duck, but had probably not reflected on his activity. Tanya's question was apparently the impetus for Lee's analysis of his drawing in terms of its component parts and their relation to each other. This is one prototype of an event that provokes the projection of an action scheme from a lower to a higher level of knowing.

In other cases the child is pulled toward a higher level of knowing by an encounter where he tries to explain what is unsatisfactory about a drawing, as in Anna and Tanya's dialogue above. Anna has practical knowledge of the roundness of balls before this encounter. She may or may not have this knowledge at a conceptual level. Her desire to instruct Tanya as to what's wrong with her drawing may play a role in triggering a more representational level of understanding for Anna. The common point in these instances (is it Tanya?) is a situation where there is a need or reason for articulating what has formerly been implicit or practical knowledge.

The second aspect of reflexive abstraction, the restructuring or reconstruction of knowledge, is typically provoked by a conflict of some kind. We

have given numerous examples where it appears that a mental conflict is precipitated by peer criticism or by a discrepancy between one's perception of a drawing and that of another person.

A discrepancy can also arise through hearing someone express an idea about drawing that differs from one's own conception or is at a higher level of knowledge. Even without a child being personally involved in an interaction, a peer comment can create a conflict that leads to a change in the child's awareness or understanding.

A future step in investigating these issues may be to experimentally manipulate the input children receive. The purpose of the current paper was to identify events that are plausible candidates for a role in provoking children's representational awareness and to propose mechanisms by which these events may affect children's development.

Table 1

THE CHILD'S UNDERSTANDING OF THE NATURE OF DRAWING

Possibility/Need for Likeness

1. "Hey, you have to do hands like that. Look, I'll show you." (Instructing peer on achieving likeness)

2. "That's not how big airplanes are [to peer]. They're bigger than that. I'm making mine bigger than yours." (Critiquing peer likeness)

3. "Are mustaches up here or down there [above or below the mouth; asking E] (Soliciting information in order to achieve likeness)

4. "I'm not finished with mine yet. What did I forget? The body and the neck." (Reflecting on completeness/accuracy of likeness)

5. "I know how to make kids but not a playground." ('Knowledge of not knowing' how to create the likeness)

6. "It's going to be hard to draw my dress." (Knowledge of difficulty of creating the likeness)

Possibility/Limitation of Drawings in Conveying Information

1. "Guess what this is?" (Recognizing possibility of conveying information)

2. "I'm gonna draw a house to show you how the McDonald's looked." (")

3. "I'm gonna put my house on it so Colleen will know how my house looks."("

4. "This is not a church. Our house is this huge." (Recognizing possibility of misinterpretation)

5. "These are not the eyes [in picture of Halloween mask] These are the puffs." (Recognizing possibility of misinterpretation)

6. "I'm gonna put an 'M' so they'll know it's McDonald's." (Recognizing possibility of misinterpretation)

Possibility of Exercising Selection/Discretion in Drawing

1. "Now I'm making a real bad storm but I'm not going to do it like Henry's." (Recognizing that there are different ways of drawing X)

2. "You don't have to make everything." (Recognizing the possibility of selection in drawing)

3. "I'm not gonna make all the rugs. I'm just gonna make some of it." (Recognizing the possibility of selection/discretion)

4. "I think I'll get a darker color for my dress." (Recognizing the possibility of selection/discretion)

Table 1 (Continued)

Possibility of Altering Reality in Drawing

1. [In response to peer suggestion of making her McDonald's purple] "It's not funny. You can do that. It doesn't matter what color you make it."

2. "I'm going to make the elevator. There's no elevator there, but I want to make one."

3. "That's black 'cause that's how I want McDonald's to look."

4. "Now I'm going to make a black boy. Guess what? Girls have hair and boys have hair, but I'm making a boy that's bald. No hair at all, but a little, I guess."

Possibility of Drawing Objects or Events in Various States, Forms, or Positions

1. "That's when the snow is just falling. So we'll put a little grass in 'cause that's when the snow is just falling."

2. "Now, I'm going to make Kathy. She's going to be happy in this one."

3. "No, I'm not making that kind of duck [duck in the air]. I'm making a mad duck."

4. [In reaction to peer saying he was drawing a rain storm] "I'm gonna make mine only be sprinkling."

Difficulty of Conveying Certain Aspects in Drawing

1. [Child draws on the back of his page the mirror-image of the pig he has drawn on the front] "Here's the mouth. The other part is in the back. I did the other part in the back."

2. "You can only see two wheels [of a car]. The other two are on the other side."

Table 2

CATEGORIES OF PEER INTERACTION

I. Child$_1$ questions or criticizes drawing of Child$_2$

(1) A: Oh, that ball doesn't look very good in drawing it [T's drawing]
T: So, it could be a ball.
A: Well, it doesn't look rounded up.
T: No, this is an egg I'm making. An egg, that is the shape of an egg.

(2) D: Why all the colors purple?
T: 'Cause.
D: 'Cause why? 'Cause why?
T: 'Cause — That's right. A person is not all colors. A person is only white.

(3) J: I'm putting my purple eggs.
C: They are not supposed to be colored purple. They could be either brown or white. Those are the only colors they could be.
J: There's some yellow eggs.
C: Yellow eggs. Hey, they could be your white eggs, Jennifer.

(4) B: It's red - that's a Phillies jacket alright.
C: That doesn't look like a Phillies jacket.
B: Wowee. Well, it is red and it has a little white patch on it.

(5) M: [to C. about his duck] That looks like a worm, Courtney. The one flying up in the air looks like a worm, Courtney.

(6) S: [to C. about her picture] You can hardly see yourself.
C: Well, you can see me.
S: Hardly.
C: You can see the grasss behind me.
S: Hardly, hardly.

II. Child$_1$ and Child$_2$ identify the same picture differently

(1) C: Oh, you drew a sun.
S: It's a flower.

(2) M: Now guess what it is.
D: Looks like a kangaroo. It has big ears.
M: But it's not a kangaroo.

(3) S: What do you suppose this is?
D: A gate.
S: ...It's a pencil.
D: It doesn't look like a pencil.
S: It will. It will!
D: That is not a pencil. A pencil has a straight line. There's a line and a point like this.

Table 2 (Continued)

II. Child$_1$ and Child$_2$ identify the same picture differently (continued)

(4) T: Your goon is lying down. (The children are drawing "goons" from a favorite song).
M: Nope, standing up. That's how a goon looks like. Its legs are crossing that way.

(5) D: What are you making?
S: You'll see when I'm done.
D: Is it a train with all these wheels?
S: No, it couldn't be that. You'll see. Just wait. You'll see.
D: It looks like a train. On a track.
S: See, now it doesn't look like a train.

III. Child$_1$ hears Child$_2$ asking how to draw something or finding fault with his/her own drawing

(1) J: Does trees — don't trees have bottoms like that [to E]

(2) M: Are mustaches up here or down there? [to E]

(3) S: I made the arms too long.

(4) C: I made a kitten that looks like a mouse.

(5) L: I don't remember how her tail is.

(6) C: I just did a mistake. He's [the duck] looking away from here. He's supposed to look that way but he's looking that way.

(7) T: I don't know how to make a duck.
L: So there. It's 2 lines, a line across, and 2 lines, a line across and a head and a beak.
T: I still don't know how to make a duck.
L: Try all that and then you'll do it.

IV. Child$_1$ hears Child$_2$'s comment expressing an aspect of the nature of drawing or the drawing process

[See Table 1 for numerous examples] Some additional examples:

(Verbalizing about one's planning, reflecting, or problem-solving)

(1) K: I have to think what it looked like.

(2) C: I'm making the body first so I'll have room for it all.

(3) K: Here, I have to try it on this paper (a trial page) 'cause I did it wrong. In case I did it wrong, I try it on this paper.

(4) M: First I'm gonna make the head and then the body.

IV. Child$_1$ hears Child$_2$'s comment expressing an aspect of the nature of drawing or the drawing process (continued)

(5) J: See him? He's talking with his mouth open, with an "O" in this mouth, with pink.

(6) L: I'm making his arm crooked 'cause he's throwing.

(7) T: I got it. I got it... I have to put him [a puppet] down here [bottom of page] for his feet so I can put the strings all the way up here. I put the handle right here. I put the strings all the way up to here.

(Verbalizing about one's drawing schemes)

(8) H: I'm making a circle for the face.

(9) M: A dot for the raindrop. A big dot for the snow.

(10) L: It's 2 lines, a line across and 2 lines, a line across, and a head and a beak.